

1 **What is claimed is:**

2 1. A combination of a rotor and a supporting structure for the rotor, the combination  
3 comprising:

4 a metal axle tube;

5 a holding member securely mounted in the axle tube, the holding member including a  
6 hole and an inner flange formed on an inner periphery defining the hole;

7 a supporting member securely mounted in the axle tube and including a supporting  
8 portion;

9 a fixing member securely mounted in the axle tube and including an opening; and

10 a rotor having a shaft provided to a center thereof, the shaft including an engaging  
11 groove, the shaft being extended through the hole of the holding member and the opening of  
12 the fixing member with an end face of a distal end of the shaft rotatably resting on the  
13 supporting portion of the support member and with the fixing member engaging with the  
14 engaging groove of the shaft, whereby the shaft and the inner flange of the holding member  
15 have a slight contact therebetween.

16 2. The combination as claimed in claim 1, wherein the axle tube includes a hole, and wherein  
17 the holding member, the support member, and the fixing member are tightly engaged with an  
18 inner periphery defining the hole of the axle tube.

19 3. The combination as claimed in claim 1, wherein the axle tube includes a hole, the holding  
20 member and the support member being tightly engaged with an inner periphery defining the  
21 hole of the axle tube, the fixing member being sandwiched between the holding member and  
22 the support member.

23 4. The combination as claimed in claim 1, wherein the holding member is a ring directly  
24 mounted to an inner periphery of the axle tube.

25 5. The combination as claimed in claim 1, wherein the holding member is a ring, the axle tube  
26 including an inner periphery having a stepped portion on which the ring rests.

6. The combination as claimed in claim 1, wherein the axle tube includes an inner periphery having a stepped portion against which the support member abuts.

7. The combination as claimed in claim 1, wherein the support member includes a closed bottom that forms the supporting portion.

8. The combination as claimed in claim 1, wherein the supporting portion of the support member includes a hole, further comprising a cover for covering the hole, the end face of the distal end of the shaft rotatably resting on the cover.

9. The combination as claimed in claim 1, wherein the fixing member includes an annular wall which abuts against the supporting portion of the support member.

10. The combination as claimed in claim 1, wherein the axle tube includes an inner periphery having a stepped portion against which the fixing member and the supporting member abuts.

11. The combination as claimed in claim 1, wherein the axle tube includes an inner periphery having a stepped portion against which the fixing member abuts.

12. The combination as claimed in claim 1, further comprising a base to which the axle tube is securely mounted, a balance plate being mounted to the base and made from magnetically conductive material, the rotor including a permanent magnet, the permanent magnet and the balance plate attracting each other.

13. A combination of a rotor and a supporting structure for the rotor, the combination comprising:

a metal axle tube including a ring formed on an inner periphery thereof;

a supporting member securely mounted in the axle tube and including a supporting portion;

a fixing member securely mounted in the axle tube and including an opening; and

a rotor having a shaft provided to a center thereof, the shaft including an engaging groove, the shaft being extended through the ring of the axle tube and the opening of the fixing member with an end face of a distal end of the shaft rotatably resting on the supporting portion of the support member and with the fixing member engaging with the engaging groove of the

shaft, whereby the shaft and the inner flange of the holding member have a slight contact therebetween.

14. The combination as claimed in claim 13, wherein the axle tube includes an inner periphery having a stepped portion against which the fixing member abuts.

15. The combination as claimed in claim 13, wherein the support member includes a closed bottom that forms the supporting portion.

16. The combination as claimed in claim 13, wherein the supporting portion of the support member includes a hole, further comprising a cover for covering the hole, the end face of the distal end of the shaft rotatably resting on the cover.

17. The combination as claimed in claim 13, wherein the fixing member includes an annular wall which abuts against the supporting portion of the support member.

18. The combination as claimed in claim 13, wherein the axle tube includes an inner periphery having a stepped portion against which the fixing member and the supporting member abuts.

19. The combination as claimed in claim 1, further comprising a base to which the axle tube is securely mounted, a balance plate being mounted to the base and made from magnetically conductive material, the rotor including a permanent magnet, the permanent magnet and the balance plate attracting each other.